

**REMARKS/ARGUMENTS**

**I. Status of the Claims**

Claims 35-51, and 66-68 are pending in this Application, and stand rejected. It is Applicants' understanding of the Advisory Action dated August 10, 2004, that the After Final amendments submitted July 28, 2004 have been entered. If this understanding is incorrect, Applicants request that these amendments be entered herein.

**II. Interview**

Applicants respectfully thank the Examiner for his time during the telephonic interview on September 14, 2004. In that interview Applicants discussed the possibility of submitting a Declaration with new testing data, where the only parameter that is varied is the amount of zinc oxide, in light of M.P.E.P. § 2131.03(II). The Examiner indicated that such data would be useful and that a single accelerator may be used, rather than the combination of various types of Cohen.

**III. Rejection Under Section 102(b)**

In issuing the Advisory Action dated August 10, 2004, the Examiner maintains the rejections of claims 35-68 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,861,842 to Cohen et al. ("Cohen") "substantially as set forth in the [August 28, 2003] Office Action." Specifically, in the August 28, 2003 Office Action, the Examiner asserts that "the cure systems [of Cohen] are taught as comprising 0.5 to 2.0 phr sulfonamide accelerators, 1.0 to 5.0 phr of zinc oxide or zinc stearate and 0.75 to 3.0 phr sulfur-vulcanizing agents." Aug. 28, 2003, Office Action at 2. In response to Applicants' amendments, the Examiner argues that "the reference need not provide a

specific example in order to satisfy the requirements for rejection under 35 USC 102.”

May 18, 2004, Office Action at 2. Applicants respectfully traverse the rejection for at least the following reasons.

**A. Independent Claims 35 and 45**

A claim is anticipated only if **each and every element as set forth in the claim** is found . . . in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987) (emphasis added). Further, “[t]he identical invention must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989). See also M.P.E.P. § 2131. Additionally, a compound or composition of matter can only be anticipated if the disclosure of a single reference places the compound or composition in possession of the public. See *In re Brown*, 329 F.2d 1006, 1011 (C.C.P.A. 1964). The reference must “clearly and unequivocally disclose the claimed compound or direct those skilled in the art to the compound without any need for picking, choosing, and combining various disclosures . . . .” *In re Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972).

Cohen does not teach each and every element as set forth in the present claims. Among other things, Cohen does not teach “an effective amount of at least one activator, expressed as equivalents of zinc oxide, **less than or equal to 0.6% by weight based on the total weight of the tread.**” See claims 35 and 45. As the Examiner has acknowledged, Cohen teaches “1.0 to 5.0 phr of zinc oxide or zinc stearate.” Aug. 28, 2003, Office Action at 2 (citing Cohen abstract). While Cohen does not disclose how much should be found in the tread, the Examiner has argued further

that “[t]he quantities taught by the reference at least overlap with those claimed instantly when adjusted for the total weight of the tire composition.” August 10, 2004 Advisory Action at 2.

Applicants submit that the Examiner’s argument is merely speculation regarding what a person of ordinary skill in the art would understand Cohen to teach. Specifically, Applicants submit that Cohen does not teach the inter-relationship between the various accelerators and activators. In other words, Cohen does not teach that one can select the lowest amount of zinc oxide and the greater amounts of elements of Cohen’s cure system so as to obtain a “an effective amount of at least one activator, expressed as equivalents of zinc oxide, less than or equal to 0.6% by weight based on the total weight of the tread.” In fact, Examples 1-8 disclose zinc oxide in an amount near 1.5% and near 2.2%, which is significantly greater than 0.6%

Even if, for the sake of argument, Cohen’s disclosure of “1.0 to 5.0 phr of zinc oxide or zinc stearate,” touches the presently claimed range amount of “at least one activator, expressed as equivalents of zinc oxide, less than or equal to 0.6% by weight based on the total weight of the tread,” Cohen still does not anticipate the present claims, because it does not disclose the claimed range with sufficient specificity.

According to M.P.E.P. § 2131.03(II):

[w]hen the prior art disclosed a range which touches, overlaps or is within the claimed range, but no specific examples falling within the claimed range are disclosed, a case by case determination must be made as to anticipation. In order to anticipate the claims, the claimed subject matter must be disclosed in the reference with ‘sufficient specificity to constitute an anticipation under the statute.’ . . . **If the claims are directed towards a narrow range, the**

**reference teaches a broad range, and there is evidence of unexpected results within the claimed narrow range . . . it may be reasonable to conclude that the narrow range is not disclosed with 'sufficient specificity.'**

M.P.E.P. § 2131.03(II) (emphasis added). Applicants submit to the Examiner that, as demonstrated in the specification as filed, and reinforced by the comparative testing results in the Declaration under 37 C.F.R. § 1.132 submitted herewith, Cohen does not anticipate the present claims according to M.P.E.P. § 2131.03.

As Applicants have previously pointed out to the Examiner, the specification of the present invention discloses several unexpected results, including at least: (a) tires with increased resistance to wear; (b) limiting of problems related to the use of polybutadiene in the polymer base of a rubber composition of a tire; (c) improved tire performance in terms of tear resistance; and (d) improved tire performance in terms of resistance to the chunking phenomenon.

The increased resistance to wear is accompanied by substantially unaltered values of rolling resistance and wet-skid resistance. See Specification, at p. 4/II. 23-29, p. 27/II. 11-20, p. 28/II. 21-31, p. 30/II. 1-10, and Tables II, IV, and VI. Rubber compositions showing this increased resistance to wear include those where the reinforcing filler is 100% silica (*id.*, Table II), 50% silica and 50% carbon black (*id.*, Table IV), and 100% carbon black (*id.*, Table VI).

The performance of a tire of the invention can be optimized both in terms of tear resistance and resistance to the chunking phenomenon, particularly under severe-use conditions. (*Id.*, p. 5/II. 27-31).

Applicants now submit additional experimental data to reinforce the original teachings of the specification. As shown in Tables IA, IB, and IC, of the Declaration, the three sets of Inventive and Comparative Compositions comprise the same ingredients in the same amount, except for the amount of activator, expressed as equivalents of zinc oxide, which varied. The three sets of compositions vary based on the type of filler: 50% carbon black and 50% silica by weight of filler, 100% silica by weight of filler, and 100% carbon black by weight of filler. See Declaration under 37 C.F.R. § 1.132 at ¶¶7

The inventive Compositions MMX06, MMX04, SIL06, SIL04, CB06, and CB04, possess all of the elements of independent claims 35 and 45, including at least one activator, expressed as equivalents of zinc oxide, less than or equal to 0.6% by weight based on the total weight of the tread. See Declaration under 37 C.F.R. § 1.132 at ¶¶9. The Comparative Compositions MMX22, MMX15, MMX10, SIL22, SIL15, SIL10, CB22, CB15, CB10 possess all of the elements of independent claims 35 and 4, except that the amount of activator is in accordance with Examples 1-8 of U.S. Patent No. 4,861,842. See *id.* at ¶¶8.

As demonstrated by the testing of the vulcanized Comparative and Inventive compositions, shown in Table II, the Inventive Compositions show superior wear resistance over the Comparative Compositions. See Declaration under 37 C.F.R. § 1.132 at ¶¶ 14 and Table II. Moreover, the wear resistance improves as the amount of zinc oxide decreases. This improved performance is seen, while maintaining wet skid resistance and rolling resistance (which are related to the values of  $\text{Tan}\delta$  at 0°C and 70°C respectively). See *id.* A person of ordinary skill in the art, prior to Applicants'

discovery would have expected wear resistance results comparable to the Comparative Compositions and not expect improved wear resistance without compromising either wet skid resistance and/or rolling resistance. See *id.* at ¶15.

One of ordinary skill in the art would not consider the disclosure of Cohen to be of “sufficient specificity” to constitute an anticipation of the claims because: (1) Cohen teaches a broad increasing range of 1.0 to 5.0 phr of zinc oxide or zinc stearate; (2) the examples of Cohen do not teach a composition with zinc oxide within the claimed range; and (3) one skilled in the art would not expect the superiority of the claimed compositions with the claimed range of at least one activator from Cohen’s teachings. Accordingly, Cohen does not place the presently claimed composition in the possession of the public, and cannot be said to anticipate. See *In re Brown*, 329 F.2d 1006, 1011 (C.C.P.A. 1964).

Thus, for at least the foregoing reasons, the § 102(b) rejection of Claims 35 and 45 over Cohen is improper and Applicants respectfully request its withdrawal.

**B. Dependent Claims 36-44, 46-51, and 66-68**

Applicants submit that dependent claims 36-44, 46-51, and 66-68 also are patentable under 35 U.S.C. § 102 over the cited references, including Cohen and the other art of record, at least due to the direct or indirect dependency of claims 36-44 from independent claim 35, and the direct or indirect dependency of claims 46-51 and 66-68 from independent claim 45.

Thus, for at least the foregoing reasons, the § 102(b) rejection of dependent claims 36-44, 46-51, and 66-88, over Cohen is improper and Applicants respectfully request its withdrawal.

**C. Claim Scope**

In discussing the specification, claims, and Declaration submitted herewith, it is to be understood that Applicants are in no way intending to limit the scope of the claims to any exemplary embodiments described in the specification or abstract and/or shown in the drawings. Rather, Applicants believe that Applicants are entitled to have the claims interpreted broadly, to the maximum extent permitted by statute, regulation, and applicable case law.

**CONCLUSION**

In view of the foregoing remarks and Declaration under 37 C.F.R. § 1.132 submitted herewith, Applicants respectfully request the reconsideration of this Application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: May 17, 2005

By: Deborah M. Herzfeld  
Deborah M. Herzfeld  
Reg. No. 52,211

Attachment: Declaration under 37 C.F.R. § 1.132 of Fabio NEGRONI





4. I am one of the inventors of U.S. Patent Application No.: 09/884,060.

5. Either I, or those under my direct supervision, performed the experiments described below.

6. Given my education and experience, particularly in the area of automotive tires and their compositions, I consider myself able to provide the following testimony based on experiments conducted by me or under my direct supervision.

**I. COMPARATIVE TESTING**

**A. PREPARATION OF THE RUBBER COMPOSITIONS**

7. Comparative testing was performed with fifteen rubber compositions, which were prepared according to the procedures given in Examples 1-2 of U.S. Patent Application No. 09/884,060. These compositions were divided into three groups based on the kind of reinforcing filler used:

- a first group including Inventive Compositions MMX06 and MMX04 and Comparative Compositions MMX22, MMX15, and MMX10; comprising 50% carbon black (CB) and 50% silica by weight, relative to the total weight of reinforcing filler;
- a second group including Inventive Compositions SIL06 and SIL04 and Comparative Compositions SIL22, SIL15, and SIL10; comprising 100% silica by weight, relative to the total weight of reinforcing filler;
- a third group including Inventive Compositions CB06 and CB04 and Comparative Compositions CB22, CB15, and CB10; comprising 100% carbon black (CB) by weight, relative to the total weight of reinforcing filler.

8. The Comparative Compositions were prepared in accordance with the procedures and ingredients types given in Examples 2, 4 and 8 of U.S. Patent

Application No. 09/884,060. The Comparative Compositions had the compositions shown in the following Tables IA, IB, and IC, respectively. When the Comparative Compositions were formed into respective tire treads, they were tire treads comprising a vulcanized polymeric base including:

at least one reinforcing filler dispersed in the polymeric base,  
an amount of extractable residue of at least one vulcanization accelerator,  
containing at least one carbon atom bound to at least two sulfur atoms, greater than or equal to 0.5% and less than or equal to 1.8% by weight based on a total weight of the tread;

an effective amount of activator in accordance with Examples 1-8 of U.S. Patent No. 4,861,842; and

an amount of combined sulfur less than or equal to 2.5% by weight based on the total weight of the tread.

9. The Inventive Compositions were prepared in accordance with the procedures and ingredients types given in Examples 2, 4 and 8 of U.S. Patent Application No. 09/884,060. The Inventive Compositions had the compositions shown in the following Tables IA, IB, and IC, respectively. When the Inventive Compositions were formed into respective tire treads, they were tire treads comprising a vulcanized polymeric base including:

at least one reinforcing filler dispersed in the polymeric base,  
an amount of extractable residue of at least one vulcanization accelerator,  
containing at least one carbon atom bound to at least two sulfur atoms, greater than or

equal to 0.5% and less than or equal to 1.8% by weight based on a total weight of the tread;

an effective amount of at least one activator, expressed as equivalents of zinc oxide, less than or equal to 0.6% by weight based on the total weight of the tread; and

an amount of combined sulfur less than or equal to 2.5% by weight based on the total weight of the tread.

10. The amount of activator was determined by means of the analytical methods described in ISO 6001/1 standard for the determination of the activator in accordance with U.S. Patent Application No. 09/884,060.

**B. Test Measurements**

**1. DETERMINATION OF THE PROPERTIES OF THE RUBBER COMPOSITIONS**

11. According to procedures conventional *per se* and known in the art, the Inventive and Comparative Compositions were submitted to vulcanization and then to a number of tests in order to evaluate some characteristic parameters of the vulcanized compositions. Such parameters are considered as representative of the characteristics of a tire tread obtained with said compositions.

12. The parameters taken into consideration, which were also considered and described in U.S. Patent Application No. 09/884,060, were the following:

T90 = time at 170°C necessary to reach 90% of the final couple value measured by means of Monsanto rheometer model MDR 2000;

TS2 = time at 170°C necessary to achieve an increase of two rheometric units measured by means of Monsanto rheometer model MDR 2000;

CA 1 = traction force (referred to the section of the test piece), necessary to have a 100% strain, measured according to DIN 53504 standard;

CA 3 = traction force (referred to the section of the test piece), necessary to have a 300% strain, measured according to DIN 53504 standard;

IRHD = International Rubber Hardness Degree measured according to DIN 53519 standard, part 1;

R.E. = % elastic yield measured by torsion pendulum (pendulum Zerbinii), according to ISO 4662 standard;

abraded volume = amount of rubber composition removed operating in the standard conditions specified in DIN 53516 standard;

$E' 0^{\circ}\text{C}$  = elasticity modulus measured at  $0^{\circ}\text{C}$ ;

$E'' 0^{\circ}\text{C}$  = loss modulus measured at  $0^{\circ}\text{C}$ ;

$\text{Tan}\delta 0^{\circ}\text{C}$  = ratio between the loss modulus ( $E''$ ) and the elasticity modulus ( $E'$ ) measured at  $0^{\circ}\text{C}$ ;

$E' 70^{\circ}\text{C}$  = elasticity modulus measured at  $70^{\circ}\text{C}$ ;

$E'' 70^{\circ}\text{C}$  = loss modulus measured at  $70^{\circ}\text{C}$ ; and

$\text{Tan}\delta 70^{\circ}\text{C}$  = ratio between the loss modulus ( $E''$ ) and the elasticity modulus ( $E'$ ) measured at  $70^{\circ}\text{C}$ .

13. The values of  $E'$ ,  $E''$  and  $\text{Tan}\delta$  were determined by using commercially available apparatuses of the company INSTRON, and submitting a cylindrical test-piece made of vulcanized rubber composition, having a length of 25 mm and a diameter of 14 mm, precompressed up to a longitudinal deformation of 25% of its original height and kept at the prefixed temperature ( $0^{\circ}$  or  $70^{\circ}\text{C}$ ), to a dynamic sinusoidal deformation

having a maximum width of  $\pm 3.50\%$  of the height under preloading, with a frequency of 10 cycles per second (10 Hz). The results of the experimental tests carried out are shown in the following Table II.

**C. Discussion**

14. The greater the amount of abraded volume, the poorer the performance. The greater the  $\text{Tan}\delta$  at  $0^\circ\text{C}$ , the better the wet skid resistance. The greater the  $\text{Tan}\delta$  at  $70^\circ\text{C}$ , the poorer the rolling resistance performance. Accordingly, in the light of the experimental results reported in Table II, it is my opinion that all three sets of Inventive Compositions achieve, with respect to the three sets of Comparative Compositions, a marked improvement in terms of wear resistance (which is related to the amount of removed rubber composition), without diminishing performances in terms of wet skid resistance and rolling resistance (which are related to the values of  $\text{Tan}\delta$  at  $0^\circ\text{C}$  and  $70^\circ\text{C}$  respectively).

15. Prior to Applicants' discovery that an effective amount of at least one activator, expressed as equivalents of zinc oxide, less than or equal to 0.6% by weight based on the total weight of the tread yields improved performance, a person of ordinary skill in the art would have expected comparable wear resistance results between the Inventive Compositions, MMX06 and MMX04, SIL06 and SIL04, and CB06 and CB04, and the Comparative Compositions, MMX10, MMX15, and MMX22; SIL10, SIL15, and SIL22; and CB10, CB15, and CB22, respectively. Prior to Applicants' discovery, a person of ordinary skill in the art would NOT have expected to find the superior performance of the Inventive Compositions MMX06 and MMX04, SIL06 and SIL04, and CB06 and CB04 over the respective Comparative Compositions.

16. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Dated: 12/5/2005

By: Fabio Negroni  
Fabio NEGRONI

TABLE IA

Example 4 - 50/50% silica/CB	Comparative Compositions			Inventive Compositions	
	MMX10	MMX15	MMX22	MMX06	MMX04
S-SBR Buna VSL 5025 HM-1	50	50	50	50	50
BR Europrene Neocis	20	20	20	20	20
NR	30	30	30	30	30
CB (N375)	30	30	30	30	30
Zeosil 1165 MP	30	30	30	30	30
TESPT	4,8	4,8	4,8	4,8	4,8
aromatic oil	10	10	10	10	10
wax	1	1	1	1	1
stearic acid	2	2	2	2	2
ZnO	1,86	2,81	4,16	1,11	0,74
6PPD	2,5	2,5	2,5	2,5	2,5
MBTS 80	3,75	3,75	3,75	3,75	3,75
sulfur	1	1	1	1	1
amount of ZnO, expressed as equivalents of zinc oxide, based on the total weight of the tread (%)	1,00	1,50	2,20	0,60	0,40

TABLE IB

Example 2 - 100 % silica	Comparative Compositions			Inventive Compositions	
	SIL10	SIL15	SIL22	SIL06	SIL04
S-SBR Buna VSL 5025 HM-1	80	80	80	80	80
BR Europrene Neocis	33	33	33	33	33
NR	10	10	10	10	10
Zeosil 1165 MP	70	70	70	70	70
TESPT (X50S)	11,20	11,20	11,20	11,20	11,20
aromatic oil	5	5	5	5	5
wax	1	1	1	1	1
stearic acid	2	2	2	2	2
ZnO	2,21	3,34	4,93	1,32	0,88
6PPD	2,5	2,5	2,5	2,5	2,5
MBTS 80	3,75	3,75	3,75	3,75	3,75
sulfur	1	1	1	1	1
amount of ZnO, expressed as equivalents of zinc oxide, based on the total weight of the tread (%)	1,00	1,50	2,20	0,60	0,40

TABLE IC

Example 8 – 100 % CB	Comparative Compositions			Inventive Compositions	
	CB10	CB15	CB22	CB06	CB04
SBR 1500	27	27	27	27	27
SBR 1712	73	73	73	73	73
CB (N375)	60	60	60	60	60
aromatic oil	7,5	7,5	7,5	7,5	7,5
stearic acid	2	2	2	2	2
wax	1,5	1,5	1,5	1,5	1,5
ZnO	1,78	2,69	3,97	1,06	0,71
6PPD	1,5	1,5	1,5	1,5	1,5
TBBS 80	3	3	3	3	3
sulfur	1	1	1	1	1
amount of ZnO, expressed as equivalents of zinc oxide, based on the total weight of the tread (%)	1,00	1,50	2,20	0,60	0,40



TABLE II

	105002410	105002400	105002390	105002420	105002430	105002460	105002450	105002440	105002470	105002480	106002510	106002500	105002490	105002520	105002530
	MMX22	MMX15	MMX10	MMX06	MMX04	SIL22	SIL15	SIL10	SIL06	SIL04	CB22	CB15	CB10	CB06	CB04
T90 [min]	5,2	5,2	5,4	4,5	4,0	7,6	7,4	7,2	7,1	6,8	5,5	5,3	5,0	4,3	3,9
TS2 [min]	2,2	2,1	2,1	2,0	1,9	1,8	1,8	1,7	1,7	1,9	2,8	2,7	2,6	2,4	2,3
CA 1 [MPa]															
CA 3 [MPa]	2,6	2,4	2,6	2,7	2,5	2,0	2,0	2,2	2,2	2,4	2,4	2,4	2,0	2,0	1,8
	11,2	10,9	11,5	11,7	11,5	8,4	8,5	9,0	8,9	9,8	11,8	12,5	10,0	10,4	9,5
IRHD	68	68	68	70	69	68	68	69	69	69	69	70	69	68	65
IRHD	62	62	63	63	63	63	62	64	64	64	57	58	54	54	52
23°C															
100°C															
R.E. [%]	43	42	42	39	40	43	44	41	44	45	31	31	32	32	31
ABRADED VOLUME [mm3]	91	93	86	79	69	90	83	84	80	74	85	87	86	80	75
10 Hz															
E' [MPa]	10,5	10,5	10,2	10,8	11,7	10,9	10,9	11,1	11,2	10,6	16,2	15,9	15,5	15,7	14,6
E'' [MPa]	4,6	4,6	4,5	4,6	5,1	5,1	5,1	5,2	5,2	4,7	7,6	7,6	7,4	7,7	7,4
TAN DELTA	0,435	0,441	0,444	0,430	0,438	0,463	0,463	0,463	0,460	0,448	0,481	0,480	0,481	0,489	0,508
70°C															
E' [MPa]	5,3	5,3	5,1	5,5	5,7	5,3	5,2	5,4	5,5	5,3	5,6	5,6	5,2	5,3	4,9
E'' [MPa]	0,7	0,7	0,7	0,7	0,8	0,7	0,7	0,7	0,7	0,6	1,3	1,2	1,2	1,3	1,2
TAN DELTA	0,128	0,132	0,144	0,122	0,135	0,132	0,132	0,139	0,130	0,108	0,224	0,219	0,233	0,236	0,235